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Is a liberal school-to-work system more 'meritocratic'? Overeducation, social origin, and early career mobility in Germany and the United Kingdom

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ABSTRACT

This study examines the unfolding of early career trajectories of individuals entering the workforce over-educated, focusing on whether an advantaged social background compensates for initial occupational penalties across different institutional settings. Spline regression models with inverse probability weighting are performed to predict occupational achievements over the first 10 years after labour market entry for overeducated and adequately matched entrants from different classes of origin. To this end, we draw on representative longitudinal data, namely SOEP for Germany and BHPS-UKHLS for the United Kingdom, leveraging Labour Force Survey information on year- and occupation-specific educational modes to define overeducated entrants. Findings reveal that institutional settings do shape compensatory dynamics. In Germany, upward mobility among overeducated workers appears more strongly stratified by social background, with better chances to compensate for initial disadvantages observed among entrants from advantaged origins. By contrast, those from lower social backgrounds tend to experience a higher risk of remaining entrapped. In the United Kingdom, career trajectories of overeducated entrants show faster recoveries from initial penalties across social origins, although initial disadvantages are not fully offset. While these patterns hold primarily among secondary-educated entrants, degree holders experience the largest disadvantages when entering overeducated in both countries, yet showing little variation by social origin in their subsequent career progression.

1. Introduction

The transition from school to work represents a 'defining moment' for workers' occupational trajectories (Kramarz & Skans, 2014), and the experience of a 'bad entry' into the labour market, in particular entering as overeducated, can entail long-lasting penalties for workers' careers (Barbieri & Gioachin, 2025; Blossfeld, 2008; Scherer, 2004; Schmelzer & Schneider, 2020). At a societal level, the mismatch between highly educated labour supply and its demand challenges one of education's core roles: equipping school-leavers for successful integration into the labour market (Bol & van de Werfhorst, 2013a). When this function fails, the consequences extend beyond individual workers, impacting the broader economy. In addition, as disadvantageous initial working conditions leave ample room for ascribed characteristics in shaping successes and failures in the labour market (Barbieri & Gioachin, 2022), this may further have important repercussions in terms of social inequalities.

Research on social stratification and intergenerational mobility has established the impact of family background on offspring's career chances and occupational development (Friedman & Laurison, 2019; Karlson & Birkelund, 2022; Sage & Johnson, 2012). In particular, a high social background proves to be advantageous not only for the greater economic, cultural, and social resources invested and transferred for the offspring's success (Erola et al., 2016), but also because of the greater ability to compensate for disadvantages. Although individuals from an advantaged social background face a higher risk of experiencing downward intergenerational mobility, having much more at stake (Bukodi et al., 2020), their higher economic, cultural and social resources can be deployed to largely compensate for initial disadvantages and mitigate their impact (Bernardi & Gil-Hernández, 2021; Bernardi, 2014). This protective dynamic has been identified as a "glass floor" effect, whereby individuals from privileged backgrounds are better able to compensate for initial disadvantages and avoid long-term downward social mobility (Esping-Andersen & Giangregorio, 2025; Gugushvili et al., 2017).

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While extensive research has explored the influence of social background on labour market entry and the risk of overeducation, the medium- to long-term career trajectories of mismatched workers from different social backgrounds remain under-examined. Against this backdrop, this contribution investigates how the socio-economic implications of entering the labour market as overeducated — compared to an adequately matched entry — evolve during the early career and the extent to which occupational progression differs by social background, given the initial job matching condition. Moreover, these micro-level dynamics require adequate institutional contextualization, as the institutional constellation is expected to influence exposure to and consequences of labour market-related risks (Barbieri, 2025; DiPrete, 2002), as well as the moderating role of social background. Comparative evidence from Germany and the United Kingdom suggests that early career mobility trajectories are influenced by both institutional context and social background, with labour market entry positions having medium- to long-term implications for occupational outcomes (Trinh, 2023). Hence, we adopt a comparative perspective and contrast Germany and the United Kingdom, which remarkably differ in their institutional constellation and specifically in their skill regimes and production systems, as well as in their amount of employment protection legislation, which is related to the level of labour market flexibility (Barbieri & Cutuli, 2016; Hall & Soskice, 2001).

To this end, we compare the occupational achievements of overeducated and matched labour market entrants from different social classes by leveraging long-run nationally representative longitudinal studies. In addition, we perform the comparison within similar educational levels, as the non-random distribution of overeducation across educational levels may lead to the risk of contrasting overeducated and matched individuals entering at different points of the occupational distribution. Along this line, evidence is also replicated by differentiating between individuals holding a degree and those who do not. Finally, this work further contributes methodologically to the research on education-job mismatch by proposing a more refined implementation of the Realised Matches approach (Kiker et al., 1997; Quintini, 2011; Verdugo & Verdugo, 1989) that instrumentally uses external representative data to define year- and occupation-specific educational measures of central tendency to identify overeducated entrants.

Findings reveal that an advantaged social background does not *universally* neutralize the penalties associated with a 'bad entry' into the labour market, as institutional settings matter: while in Germany upward mobility among overeducated workers is largely restricted to service-class descendants, who manage to recover the initial disadvantage - whereas entrants with a middle- and working-class background remain unable to offset their initial penalty even after a decade -, in the United Kingdom, by contrast, the liberal institutional context (flexible labour market, weaker trade unions, low welfare support, generalistic educational system, etc.) allows overeducated entrants—regardless of social background—to reduce their initial disadvantage more rapidly during the first years of career (Scherer, 2004), although the pace of growth starts slowing around the fifth year. Institutional settings are shown to crucially shape the realisation of different mobility scenarios: Germany exhibits a compensatory pattern where upward mobility depends heavily on social origin, while the United Kingdom displays widespread upward trajectories and a faster and more generalised catch-up. While these general findings are confirmed among the subsample of secondary-educated entrants, in both countries, degree holders experience the largest initial penalties, and their social origin exerts minimal direct influence on career development.

We begin with a theoretical background and the review of existing evidence about overeducation, social origin, career mobility (Section 2), offering insights on: overeducation as a 'bad entry' into the labour market; the role of institutional characteristics on mobility chances; and the influence of social origin on the occupational development of young adults in relation to education-job matching, also considering differences related to the level of education. Then, Section 3 outlines the data and methods implemented, Section 4 discusses the empirical evidence, and Section 5 draws concluding reflections, highlighting existing limitations of the study and potential further developments.

2. Theoretical background and related literature

As a result of the educational expansion, contemporary societies are increasingly seen as "education-based meritocracies" (e.g., van de Werfhorst, 2024), where education is considered the key determinant of individuals' occupational achievements, and the influence of social background on achievement is perceived to be waning - although the evidence remains contested (Bernardi & Ballarino, 2016; DiPrete, 2020; Gugushvili et al., 2017). Recent debates have questioned the extent to which achieving a higher education level still fulfils its promise of facilitating access to better occupational positions, securing stable socio-economic trajectories, and delivering expected returns to the human capital investment (Barbieri et al., 2020; Di Stasio et al., 2016).

In this regard, the phenomenon of education-job mismatch, particularly in the form of overeducation, challenges traditional economic assumptions about the relationship between human capital and occupational outcomes (Goldin, 2024). When individuals are unable to fully exploit their education in their occupations, the expected benefits of educational attainment may no longer hold true.

2.1. Overeducation: micro-level theoretical mechanisms

The conditions under which young individuals enter the labour market can have long-lasting consequences on their career progression and occupational outcomes (Barbieri & Gioachin, 2025; Blossfeld, 2008; Cheng & Song, 2019; Scherer, 2005; Schmelzer & Schneider, 2020). Against this background, the concept of 'bad entry' is understood as an undesirable condition of entry into the labour market, which is expected to negatively impact career development and potentially "trap" workers in disadvantageous positions within the occupational hierarchy (Baert et al., 2013; Barbieri et al., 2019; Bernardi, 2014; Scherer, 2004).

From a theoretical perspective, initial overeducation emerges during the "two-sided matching process" between the supply and demand sides (Gebel, 2015). On the one hand, job seekers evaluate each job opportunity considering the expected returns to (their actual) education and the career progression possibilities that the job provides. The idea that an initial mismatch between education and employment can promote faster career progression and socio-economic improvements derives from Career Mobility Theory (Sicherman & Galor, 1990; Sicherman, 1991). Accordingly, job seekers may choose a job for which they are overeducated if they foresee better career development chances (Scherer, 2004; Sicherman, 1991). On the other hand, following the Signalling Theory (Spence, 1973), employers base their recruitment decisions on the signals of expected productivity and commitment of potential employees, and thus on educational credentials and previous work experience. However, since the latter is absent in the case of labour market entrants, educational credentials higher than necessary may have a positive signalling effect on recruitment decisions. Nevertheless, once in the labour market, having a working experience of overeducation can exert a negative signalling effect on workers' career development.

From this theoretical framework, two hypotheses are derived, outlining two contrasting scenarios of career development, namely 'stepping-stone' and 'entrapment' scenarios. According to the 'stepping-stone' perspective, an initial mismatch between education and occupation could serve as a gateway to better job prospects, or just as a bridge into the labour market (Voßemer & Schuck, 2016). For instance, higher-rewarding jobs or higher-affirmed firms may necessitate some initial probationary periods in demoted positions to test young workers' productivity when there are no available productivity-related signals from previous experiences (Baert et al., 2013; Gebel, 2015; Scherer, 2004). In stark contrast, the 'entrapment' perspective defines

overeducation as a source of disadvantage in the labour market that risks being reproduced, or even exacerbated, over career progression (Passaretta et al., 2023). Similarly to what has been evidenced in studying the effect of early unemployment spells on occupational trajectories (Luijkx & Wolbers, 2009), overeducation can lead to human capital loss and depreciation since it is not fully exploited in an overeducated job and can be perceived as a signal of low commitment and productivity, discouraging potential employers from hiring previously overeducated workers (Damelang & Ruf, 2023; Gangl, 2006). Therefore, overeducation may lead to lower wages and limited career mobility (Groeneveld & Hartog, 2004; Kim, 2024). The lower wage returns for overeducated workers emerged already in the seminal work of Duncan and Hoffman (1981), and these findings have been confirmed by a range of empirical studies, which highlight the persistent wage and mobility penalties faced by overeducated workers (García-Aracil & Van Der Velden, 2008; Leuven & Oosterbeek, 2011; McGuinness & Sloane, 2011; Wen & Maani, 2023).

Research on the scarring effects of overeducation has reported reduced earnings and wage trajectories (Korpi & Tåhlin, 2009), as well as a strong lock-in effect, especially in educationally stratified contexts such as the German labour market (Damelang & Ruf, 2023). We argue that the realisation of these two alternative scenarios may be strongly influenced by the features of the institutional framework and may be strongly influenced by circumstances external to the individual, such as the family background.

2.2. Germany and the United Kingdom: two different institutional constellations

The role of institutions has recently been reaffirmed in the study of education-job matching, and more broadly in the analysis of the link between institutions and inequality (Barbieri, 2025; Bol et al., 2019; Di Stasio et al., 2016; Levels et al., 2014; Verhaest & Van Der Velden, 2013). Comparative empirical findings demonstrate that the role of institutional settings influences not only labour market allocation processes but also the micro-level mechanisms shaping workers' career trajectories after a 'bad' labour market entry (Barbieri et al., 2018; Passaretta et al., 2018; Spilerman, 1977).

Germany and the United Kingdom represent two contrasting institutional constellations, differing in terms of skill regimes and production systems, and thus in their linkage between education and work as well as the strictness of labour market regulation, industrial relations systems, welfare support, and labour policies, which can influence mobility flows over the working career. Germany is characterised by a relatively rigid occupational structure with higher levels of employment protection and a tight link between education and the obtained labour market position, thanks to its dual and vocational educational system, which facilitates the school-to-work transition and the right job matching between competencies and job requirements since the beginning of individuals' careers. This configuration is usually referred to as an Occupational Labour Market (OLM: Maurice et al., 1986; Marsden, 1990) in the labour sociology literature, while the macro-political economy literature refers to it as Coordinated Market Economy (CME: Hall & Soskice, 2001). From this perspective, Germany stands for incentivising the acquisition of industry-specific skills, which favour incremental innovation and therefore stable internal careers and lower workers' turnover rates. Different is the approach to skills acquisition in the United Kingdom, identified as an Internal Labour Market (ILM) (Marsden, 1986) or a Liberal Market Economy (LME), in which the relatively standardized educational system (Barbieri, 2025; Bol & van de Werfhorst, 2013b) privileges the provision of general skills (Estevez-Abe et al., 2001), more suitable for a scarcely institutionalized school-to-work transition into a flexible, more mobile but less secure tertiary labour market (Hadjivassiliou et al., 2019) and a production system that hinges on forms of radical innovation. Clearly, labour market allocation between these two distinct institutional arrangements differs in how educational credentials are valued compared to experience and job mobility, shaping distinct pathways of labour market entry and of work career (Fauser, 2024; Gangl, 2000a). From what has been said, it follows that the signalling power of education is higher in Germany than in the United Kingdom, where, instead, the acquisition of specific competences for specific occupations usually happens directly on the job (Gangl, 2000a; Marsden, 1986).

Concerning the impact of a 'bad matching' at labour market entry on subsequent occupational outcomes, Germany and the United Kingdom are totally different worlds of work. In Germany, career mobility is limited by strict occupational boundaries, and consequently, the labour market conditions at the first job are highly relevant for workers' career trajectories (Hillmert, 2011; Manzoni et al., 2014). On the contrary, in the United Kingdom, greater career mobility is supported by a more flexible and less segmented labour market (Duta et al., 2021), job opportunities across industries, and lower stigma associated with unconventional work careers (Scherer, 2004).

Building on what has been discussed so far, we expect that in the United Kingdom, the occurrence of an entrapment scenario for overeducated workers is unlikely. On the contrary, in more rigid and educationally stratified labour markets such as the German one, a 'bad' entry as overeducated is expected to exert a greater scarring effect and to originate a consequent entrapment (Schmelzer & Schneider, 2020).

> *Formally, we hypothesise (**Hyp. 1**) that, in Germany, starting overeducated reduces chances of experiencing upward occupational mobility and catching up initial labour market penalties. On the contrary, in the United Kingdom, we expect overeducated entrants to have greater chances of upward career trajectories and to close initial penalties.*

2.3. Social origin: its impact on job-education match and career development

The family background exerts a direct impact on occupational attainments (Friedman & Laurison, 2019; Sage & Johnson, 2012), thus beyond human capital accumulation and educational achievements. At every educational level, the deployment of parental economic and social capital matters for job search and a successful labour market entry (DiPrete, 2020; Spilerman, 1977; Witteveen & Attewell, 2017). Wealthier families can provide greater financial security, enabling individuals to spend more time searching for an adequate education-job match before entering the labour market (Erdsiek, 2016). In this regard, a recent contribution on Germany and the UK has highlighted that social origin not only shapes access to higher-quality jobs but also the likelihood of entering the labour market in a position of educational mismatch (Wiedner & Schaeffer, 2020). In particular, the existing literature indicates a lower risk for the offspring of privileged classes to end up mismatched (Caroleo & Pastore, 2018; Vela, 2021). Moreover, a higher social background can positively affect occupational achievements even beyond the labour market entry (Manzoni et al., 2014) – sometimes referred to as direct effect over the career or residual direct effect (Barbieri & Gioachin, 2022; Passaretta et al., 2018), which has been empirically confirmed in both the countries of our interest (Barbieri & Gioachin, 2022; Bukodi & Goldthorpe, 2011). Parental help through their network and economic resources may prove advantageous to recover from penalties consequent to a 'bad entry' into the labour market (Lin et al., 1981). Originally formalised for educational achievements (Bernardi, 2014), stratification scholars refer to the compensatory advantages provided by the parental background, and this applies also when parents provide (any form of) support to children who face employment failures (Engzell & Wilmers, 2021; Erola & Kilpi-Jakonen, 2017) to ameliorate their otherwise less rewarding occupational trajectories. From a rational action perspective (Goldthorpe, 2007), such mechanisms are enacted to prevent offspring (and by extension the family) from experiencing social demotion and intergenerational downward mobility (Bernardi & Gil-Hernández,

2021).

Accordingly, we hypothesise (**Hyp. 2**) that, *in both countries and net of educational achievements, young workers from an advantaged social background manage to compensate for the socio-economic penalties deriving from an overeducated labour market entry.* [1]

However, we expect that, in case of a bad labour market entry, the direct influence of social origin may also vary according to the entrant's level of education: tertiary education in contemporary societies should act as the "great equaliser" of labour market opportunities (Fiel, 2020; Torche, 2011), reducing the overall direct influence of social origin (Hout, 1988) and related compensatory advantages, and making achievements more meritocratic. In contrast, the direct effect of social origin is expected to be stronger among less educated workers in a less skilled labour market (Bernardi & Ballarino, 2016). Therefore, when it comes to the compensatory capacity in case of a 'bad' entry, in line with the equalisation perspective, one could expect (**Hyp. 3a**) *the influence of social background and related compensatory advantages to be localised among less educated workers and absent for tertiary degree holders.*

The issue of tertiary education as an equaliser is the subject of a long-lasting debate with evidence for and against, often depending on the type of outcome. In stark contrast to the equalisation framework are the conflictual perspectives arguing that advantaged families will always find a way to exploit their resources to maintain their advantages. This is expected to occur even in the case of equalisation of vertical educational opportunities, as theorised by the Effectively Maintained Inequality perspective (Lucas, 2001). Accordingly, a contrasting hypothesis states that (**Hyp. 3b**) *the influence of social background and related compensatory advantages for overeducated workers is expected regardless of their level of education.*

3. Data and methods

3.1. Data and sample definition

This study relies on country-specific longitudinal household surveys to analyse the early career trajectories of young workers in Germany and the United Kingdom. For Germany, we use the German Socio-Economic Panel (GSOEP) (1999–2019), while for the UK, we combine the British Household Panel Survey (BHPS) (1999–2008) and the UK Household Longitudinal Study (UKHLS) (2009–2019). The sample selection criteria are outlined in Appendix Tables A1 and A2, which specify the number of individuals and person-year observations considered, as well as the portion of the sample excluded at each analytical step.

Our initial sample includes individuals reporting information on their occupation, from which we isolate those who began their first employment between 1999 and 2019. This selection allows tracking new entrants into the labour market over the first ten years of their careers, and minimizes potential recall bias that could arise from using retrospective data on occupational categories and socio-economic status. The population of interest includes both employees and self-employed workers who were no older than 35 years at the time of labour market entry. At this stage, overeducated workers made up 18.09% of the German sample and 30.37% of the UK sample. Such differences in the incidence of overeducation at labour market entry are consistent with evidence showing lower risks in OLM countries, characterised by stronger links between school and the labour market, as well as dual and vocational education systems (Capsada-Munsech, 2017; Verhaest & Van Der Velden, 2013; Vogtenhuber, 2014).

To focus on the comparison between matched and overeducated workers, individuals identified as undereducated at the time of labour market entry were excluded,[2] along with those without at least an upper secondary education. After applying these sample selection criteria, the final analytical samples consisted of 4918 individuals in Germany and 5370 in the United Kingdom, resulting in a total of 19,727 and 20,136 person-year observations, respectively.

3.2. Measures and analytical strategy

3.2.1. Measuring overeducation

The literature identifies three main approaches for measuring overeducation: Worker Self-Assessment (WA), Job Analysis (JA), and Realised Matches (RM). The WA approach involves directly asking workers how they perceive their own job-education match or what educational qualifications are required to obtain (or perform) their job (Verhaest & Omey, 2006). While straightforward, this approach has limitations due to potential measurement errors or biases, including social desirability bias and selection bias, as workers may overestimate job requirements or be reluctant to admit mismatches (Capsada-Munsech, 2019). In contrast, the JA method involves job analysts defining the required training for each occupation. While it minimizes biases, this approach is costly and difficult to maintain, as it requires constant updates to job requirements, which can become outdated over time, leading to inaccurate estimates (Hartog, 2000; Wen & Maani, 2023).

The RM approach, on the contrary, allows for measuring overeducation from the distribution of educational titles within each occupational category. Overeducated workers are identified as those with higher education than "most of" other workers in the same occupation (Barone & Ortiz, 2011). The benchmark for overeducation is defined statistically, using the mean, the median, or the mode of the distribution of educational attainment within each occupation (Capsada-Munsech, 2019).

In this study, overeducation at labour market entry is measured using the Realised Matches approach, specifically by adopting the modal educational level within each occupational category as the benchmark. We chose the mode over the mean or median due to its greater robustness to outliers (Kiker et al., 1997; Sloane, 2003). Following Quintini (2011), we rely on an external representative data source—the Labour Force Survey (LFS)—to calculate the modal education level using the three-digit ISCO classification[3] for each year and occupation, separately for Germany and the United Kingdom.[4] To ensure greater precision, we measure the mode annually (focusing on the potential year of entry into the labour market), considering workers hired within 24 months before observation and aged no more than 35 years. By using year- and occupation-specific benchmarks, we avoid biases related to credential

[1] We control for the potential differential selection into overeducation at labour market entry by implementing Inverse Probability Weighting (IPW).

[2] This study does not address undereducation, as the primary focus is on the dynamics of initial disadvantage in the labour market and potential compensatory advantages. Addressing undereducation would require a different analytical focus, as it entails dynamics linked to educational shortcomings, whereas overeducation reflects occupational mismatches despite individuals holding the required educational credentials.

[3] In the LFS dataset, data on occupations are available until 2010 according to the ISCO88 version of the classification, and from 2011 under ISCO08.

[4] The focus of this study is on mechanisms embedded within national contexts. By comparing Germany and the UK, we aim to assess the extent to which these mechanisms vary across institutional settings. This requires defining education-job matching within the relevant institutional context, so that workers' matching conditions are determined relative to the specific labour market they enter and move through. The method we adopt is well-suited for this purpose, as it relies on the distribution of the workforce within each national labour market.

inflation, which often occur when occupation-specific modal education levels are defined without accounting for changes over time (Verhaest & Omey, 2006). This approach helps mitigate the risk of incorrectly classifying workers as overeducated if the educational requirements of their occupation have increased since they entered the labour market.

To measure occupation-specific modal education levels, we distinguish between primary education, lower secondary, upper secondary, lower tertiary, and upper tertiary education, following the ISCED classification.[5] In the main analysis, we restrict the sample to those with upper secondary, lower tertiary, and upper tertiary education, excluding individuals with lower levels of education, as they do not face the risk of being overeducated.

3.2.2. Comparing occupational trajectories by different social origins

The analysis is conducted separately for Germany and the UK, with occupational socio-economic status, measured via the International Socio-Economic Index of Occupational Status (ISEI; Ganzeboom & Treiman, 1996), as the dependent variable.[6] Exploiting the longitudinal structure of the data, with yearly observations (t) nested within individuals (i), multilevel linear models are employed to estimate the spline function over the early career.[7] This approach allows for the consideration of both time-varying and time-constant information, as well as their interaction, to analyse career trajectories.

Eq. 1 formalizes the final estimated spline function[8] employed to study social origin differences with respect to initial overeducation.

The core models include a three-way interaction between 'matching condition' ($Overedu_i$) at first job, which distinguishes between matched and overeducated entrants, 'social origin' ($Orig_i$), and 'career'[9]; which is modelled using three splines (Sp_{itk}). Each spline is allowed to vary across individuals by setting it as a random slope. The random part of the model further includes the random intercept (μ_{0i}) and the individual-specific time-varying dispersion (ε_{it}). Social origin is operationalized using information on the parental social class. We distinguished between offspring of the Service Class (managers and professionals) against those coming from the Middle Class (small proprietors, higher grade blue and white collar) and the Working Class (skilled, semi- and non-skilled workers), operationalized following the EGP class schema[10] (Erikson & Goldthorpe, 1992) and adopting the parents' dominant class as a criterion.

$$
\begin{aligned}
y_{it} = \; & \beta_0 + \beta_1 Overedu_i + \beta_2 Orig_i + \sum_{k=1}^{3} \beta_{3k} Sp_{itk} \\
& + \beta_4 (Overedu_i \cdot Orig_i) + \sum_{k=1}^{3} \beta_{5k} (Overedu_i \cdot Sp_{itk}) \\
& + \sum_{k=1}^{3} \beta_{6k} (Orig_i \cdot Sp_{itk}) + \sum_{k=1}^{3} \beta_{7k} (Overedu_i \cdot Orig_i \cdot Sp_{itk}) \\
& + \beta_n Controls + \sum_{k=1}^{3} \beta_{nk} (Controls \cdot Sp_{itk}) + Year_t + \mu_{0i} \\
& + \sum_{k=1}^{3} \mu_{ik} Sp_{itk} + \varepsilon_{it}
\end{aligned}
\tag{1}
$$

We further include a vector of control observables such as sex, age, educational level, vocational qualification, and labour market entry cohort. Each of these variables, set as time-constant at the first year of career, is interacted with the spline terms for 'career' to account for potential sources of heterogeneity in career development. Time-varying year information is further included.

To account for *differential selection into overeducation at labour market entry*, Inverse Probability Weighting (IPW) is estimated at the labour market entry, and the resulting weights were extended to the whole career. Following the literature on the non-random selection into overeducation, we use the following predictors of the risk of starting overeducated: social origin, sex, age, migration background, attained education, vocational qualification, and region of residence.[11] Appendix Tables A3 and A4 show variation in the risk of overeducation at the first job across these predictors. Of particular relevance for our analysis is educational attainment: as the tables indicate, individuals with tertiary degrees face a higher incidence of overeducation in both Germany and the UK. This highlights the need to account for selection, especially with respect to education, before reflecting on its role in shaping both access to the labour market and the early stages of career development under initial matching constraints. In this work, overeducation is our condition of interest, and differences in initial ISEI within each country should be interpreted as adjusted for compositional differences in observed entry characteristics.

4. Empirical evidence

4.1. Initial overeducation and its socio-economic implications

Appendix Tables A3 and A4 provide additional descriptive information. We report limited gender differences, and we note that more than half of the overeducated entrants in both contexts come from the Service Class, which may be due to their higher chances of achieving higher educational achievements. Notably, German vocational education leads to greater chances of a job-education match as expected.

Fig. 1 illustrates the predicted socio-economic attainment (ISEI)[12] for matched and overeducated entrants during their early careers in Germany and the United Kingdom. These predictions are derived from a simplified version of Eq. 1 that excludes the interaction of the matching condition with social origin.

In both countries, overeducated workers face a significant initial disadvantage compared to their matched counterparts. This indicates that initial overeducation represents a 'bad entry' into the labour market in both contexts.

We first observe that the cross-country difference in socio-economic

[5] For the completion of vocational education and training qualifications, we generated a dummy variable to employ both in the implementation of the IPW and as a control variable in the models. Thus, we account for differential selection into overeducation at labour market entry and potential sources of heterogeneity in career development, which may occur specifically in Germany.

[6] This metric score is based on the ISCO88 and ranges from 16 (e.g., labourers, cleaners) to 90 (e.g., doctors, CEOs, judges). It maximises the indirect influence of education on income, via occupation, while minimising the direct influence and controlling for age (Ganzeboom et al., 1992; Ganzeboom & Treiman, 1996). Often used in retrospective settings, the ISEI scores offer significant measurement advantages over income, as any intra-individual change reflects a genuine shift in occupational stratification, and the ISEI is less prone to recall bias (Härkönen et al., 2016).

[7] Appendix Figures B1-B3 display the marginal effects of initial education-job matching.

[8] The turning points (knots) of the spline function at which the career trajectory changes its slope were identified by testing alternative functional forms. The selection of a three-spline specification with knots at the fourth and seventh years was guided by AIC and BIC model comparisons against alternative specifications (e.g., a two-spline model with a single knot at year five and a model with one knot at each year following labour market entry).

[9] In the present contribution, 'career' refers to the number of years since the respondent's first employment, taking the value 1 for the year of entry into the labour market.

[10] For the United Kingdom, this information was integrated with data on the NS-SEC classification, available in the UKHLS dataset.

[11] For Germany, we distinguish: (1) West Germany, (2) East Germany. For the United Kingdom, we refer to: (1) England, (2) Wales, (3) Scotland, and (4) Northern Ireland.

[12] Predicted ISEI scores are computed by setting all covariates at their mean values.

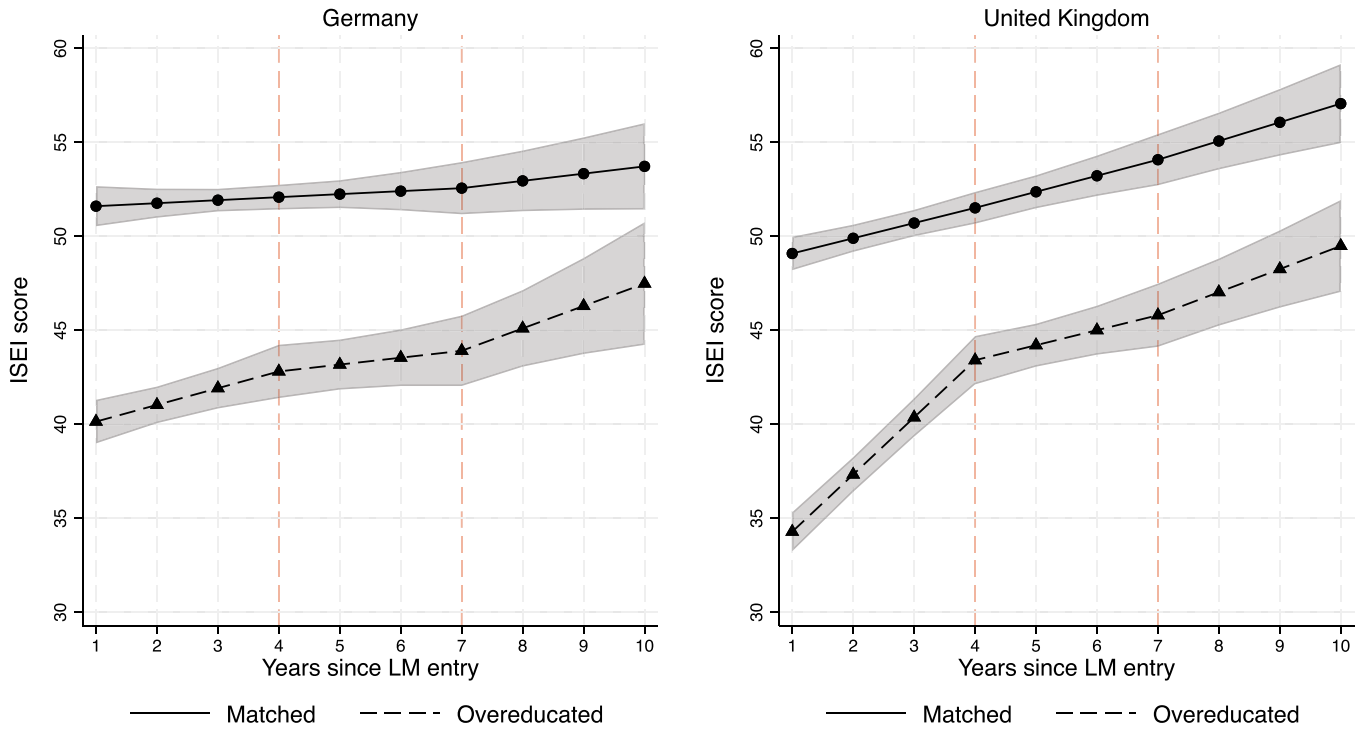

Fig. 1. Predicted ISEI over career development of matched and overeducated LM entrants, in Germany and the United Kingdom. 1–10 years in the labour market are considered.

attainment at labour market entry is mainly driven by the overeducated: they start their careers at a higher socio-economic status in Germany than in the United Kingdom, and the penalty they experience is also more pronounced in the latter (around 15 ISEI points compared to 11 in Germany). These findings are consistent with previous research, which shows that entry status is, on average, higher in an occupational labour market (OLM) such as Germany than in an internal labour market (ILM) like the United Kingdom (Gangl, 2000b). By contrast, individuals in matched positions enter the labour market with a broadly comparable socio-economic status in both countries, around 50 ISEI points.

Consistent with Hypothesis 1, contextual differences emerge in the subsequent mobility patterns. Our results are indeed consistent with evidence of higher mobility in ILM arrangements compared to OLMs (Gangl, 2000a), a finding that holds here for both matched and overeducated workers across the two countries. This pattern is particularly evident for matched workers: while the career trajectories of labour market entrants in the United Kingdom display a significant improvement in socio-economic attainment, in Germany they appear flatter, marking the greater relevance of initial conditions in OLMs. Although the higher mobility in the United Kingdom allows overeducated workers to mitigate their initial entry penalty, overeducation is nonetheless less penalizing at entry in Germany, where recruitment strongly relies on formal qualifications.

This dynamic supports the assumptions of Hypothesis 1, highlighting the greater opportunities for upward mobility after a bad entry in the United Kingdom; however, this higher mobility follows a larger initial penalty, meaning that overall, entering overeducated in an OLM system tends to be less penalizing and pays back better over the early career.

These findings underline the importance of institutional configurations in shaping the early career trajectories of overeducated workers. It is now necessary to examine how these general dynamics vary when considering the extent to which early career development differs across social backgrounds.

4.2. *Initial overeducation and the role of social origin*

Moving to our core analysis, the findings depicted in Fig. 2 present the predicted socio-economic status (ISEI) obtained from Eq. 1 for matched and overeducated labour market entrants from different social backgrounds over their first ten years of career in Germany and the United Kingdom. Empirical results are shown, distinguishing between the offspring of the service class and grouping both middle-class and working-class descendants. This distinction is made to better highlight potential advantages of the upper class over the early career when facing a 'bad' entry into the labour market.

It is important to mention that the following models, in addition to addressing non-random selection into overeducation through IPW, assume that initial differences in ISEI scores are attributed to the matching condition at the labour market entry. Subsequent trajectory differences are then examined as a function of this initial matching condition and social origin.

We highlight three key findings based on the analysis of early career trajectories in Germany and the United Kingdom.

First, in Germany, social background plays a critical role in mitigating the initial socio-economic penalties associated with overeducation and shaping upward mobility. Offspring from the service class show evidence of overcoming initial disadvantages over the first ten years of their career. Entrants with a service class background close the gap with their matched peers, highlighting their privileged experience of upward mobility, even within Germany's relatively rigid labour market. In contrast, entrants with middle- and working-class backgrounds show a flatter pathway over the early career.

Second, the British context reflects a distinct dynamic. Overeducated entrants, irrespective of their social background, mitigate their initial socio-economic disadvantages, significantly reducing the initial penalty. This rapid (but partial) recovery reflects the greater flexibility of the British labour market, which appears to facilitate early career upward mobility (Gangl, 2000a), to some extent, equalising opportunities between classes for (some) socio-economic recovery in comparison to Germany (Bernardi et al., 2000).

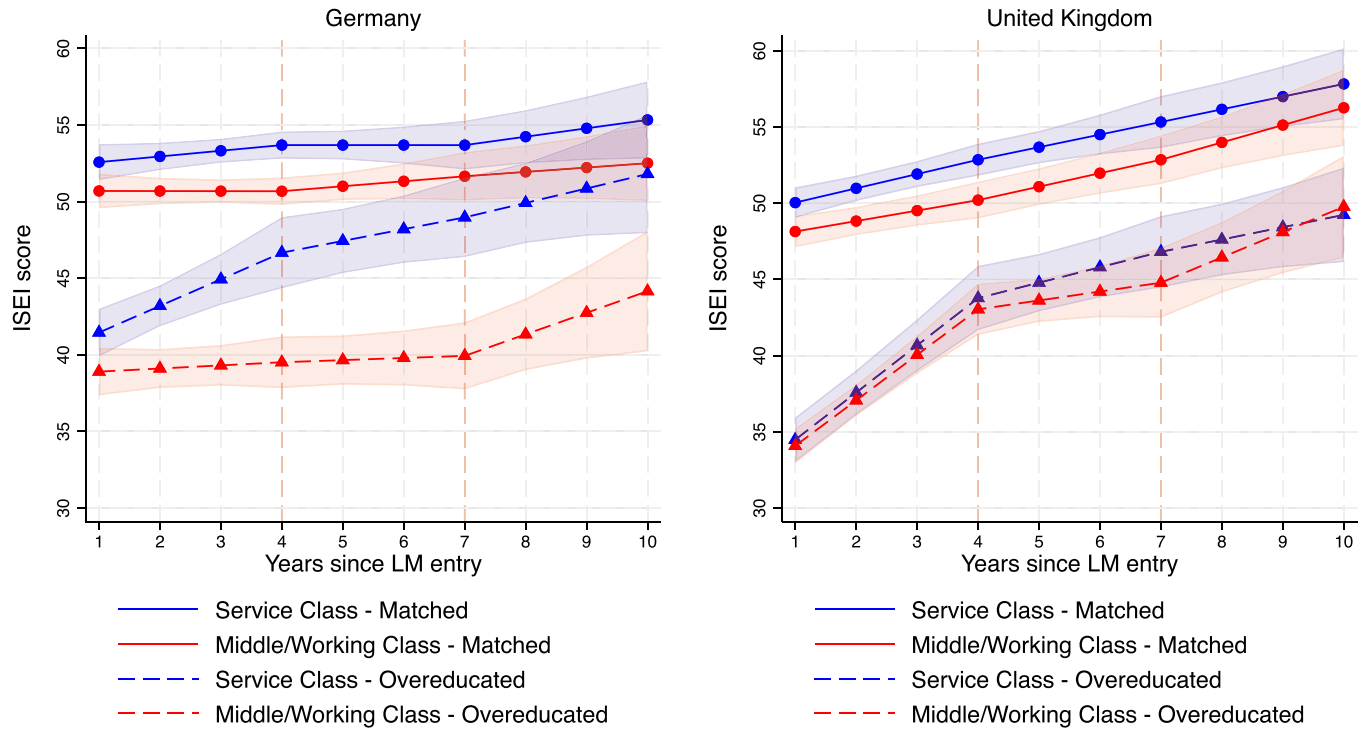

Fig. 2. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin, in Germany and the United Kingdom. 1–10 years in the labour market are considered.

Third, upward mobility patterns of the overeducated labour market entrants differ markedly between the two countries. In Germany, upward mobility is concentrated among overeducated entrants from higher social backgrounds, with an average improvement of about 10 ISEI points over a decade (from about 41–51 average ISEI points). Conversely, in the United Kingdom, both overeducated and adequately matched workers experience upward mobility, but the extent and shape of the latter's trajectories vary between these two groups. Across all social backgrounds, matched workers in the UK display a steady linear growth in socio-economic attainment, while overeducated workers recover quickly in the first few years, with their trajectories continuing to increase, albeit at a slower pace thereafter.[13]

Regarding the hypothesised role of social background (Hypothesis 2), the findings show that compensatory advantages linked to social origin are evident in Germany. An origin-related advantage is also observable among matched workers in both countries, as offspring of privileged classes secure a more advantageous entry into the labour market, which, even under equal subsequent growth, translates into enduring early career advantages over middle-class and working-class descendants.

4.2.1. Heterogeneity by educational attainment at labour market entry

In Fig. 3, we examine the socio-economic trajectories of the labour market entrants, distinguishing between overeducated and matched workers with an upper secondary education and those who attained a tertiary degree.

In Germany, our findings reveal that the compensatory mechanisms characterizing upper-class descendants operate primarily among workers with at most an upper secondary education (panel a). Overeducated workers from the service class exhibit a much steeper career growth, allowing them to offset their initial disadvantage over time. Conversely, entrants from the middle and working class without a degree experience flatter career trajectories. This pattern aligns with Hypothesis 3a, as the influence of social origin and compensatory advantages is observed exclusively among less-educated workers, while tertiary-educated workers show no such effects. The origin-related advantage in Germany is also visible among matched secondary-educated workers, who display an advantage of around 3 ISEI points during the early career, all other observed characteristics being equal.

Notably, social origin appears to have no influence on the socio-economic trajectories of graduates, aligning with an "entrapment scenario" (panel b). For matched graduates, socio-economic trajectories are relatively stagnant regardless of their class of origin, though they enter the labour market with an already high occupational status – a situation that is explained by the characteristics of the German OLM. This lack of compensatory advantages for overeducated graduates further supports Hypothesis 3a, as (certified and standardized) tertiary education appears to reduce the direct influence of social background, leaving only a reduced advantage for overeducated career starters from higher social backgrounds, as, in the first five years, they continue to display higher socio-economic attainment than their lower-class counterparts.

In the United Kingdom, we observe lower penalties associated with overeducated entry for workers with upper secondary education (panel c). These workers, regardless of their social background, manage to experience upward mobility over time. Among tertiary-educated workers, the patterns resemble those seen in Germany but with greater upward mobility for overeducated entrants during the first years following labour market entry (panel d). Nevertheless, in the UK labour market, in which the acquisition of general skills through tertiary education is prioritized, "failing" to exploit the accumulated human capital entails a larger penalty — initially about 10 ISEI points higher than in Germany and about 22 points compared to the adequately matched individuals - that cannot be offset throughout the first ten years, regardless of the class of origin. These findings support Hypothesis 3a also about the United Kingdom, as social origin advantages are not evident among tertiary-educated entrants.

To wrap up, across both Germany and the UK, overeducation among

[13] These results should be interpreted cautiously, as the implementation of the growth curves indicates a plateau in this segment of the career. Growth curves are available upon request.

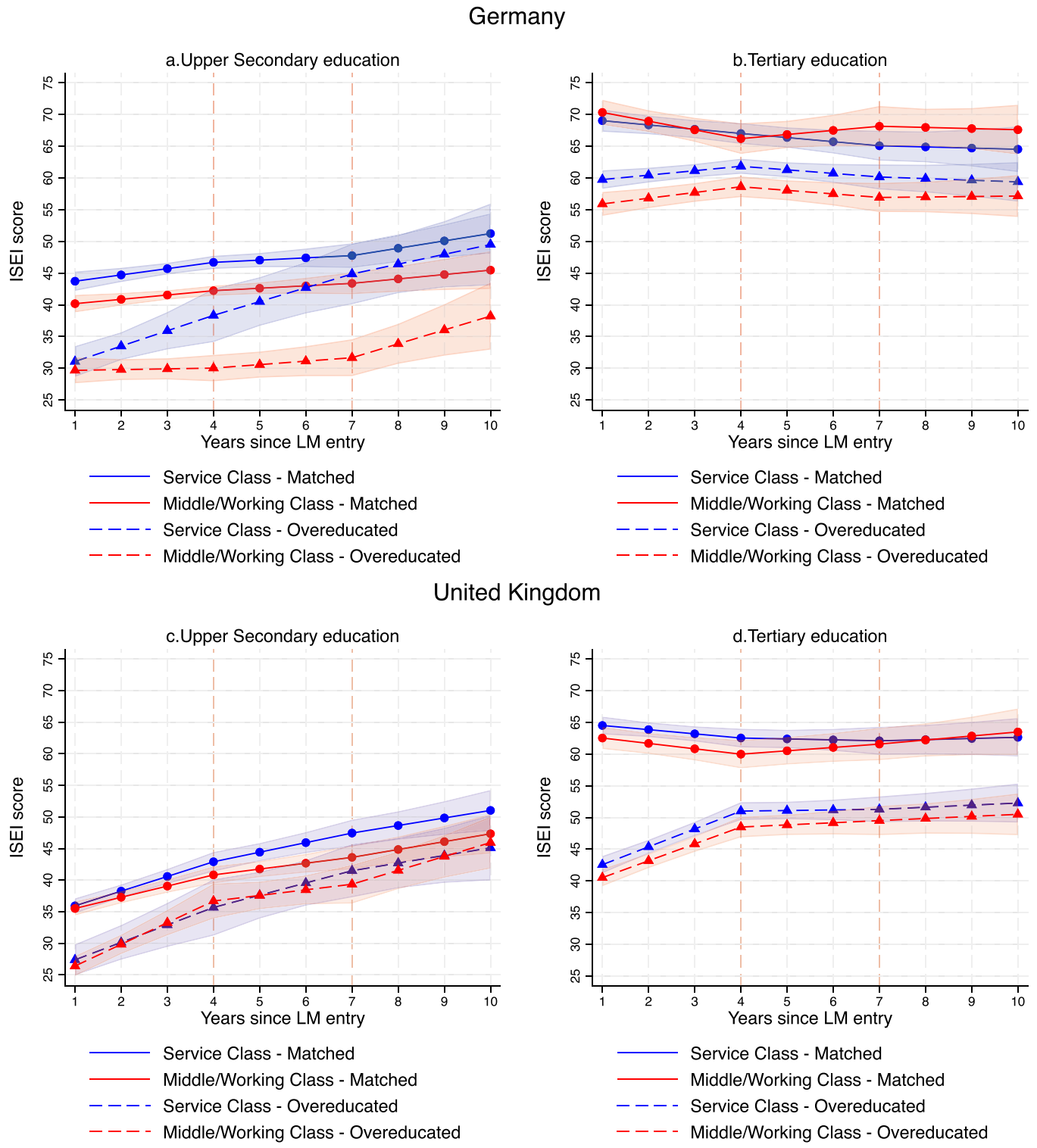

Fig. 3. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin and educational level, in Germany and the United Kingdom. 1–10 years in the labour market are considered.

graduates consistently acts as a 'bad entry', leading to entrapment in lower-tier occupations. Yet, the more flexible UK labour market allows for steeper initial career growth, though this trajectory remains insufficient to close the initial gap. Institutional context thus shapes the relationship between labour market entry conditions and subsequent career development of newly hired workers, with Germany's rigid labour market offering fewer upward mobility opportunities (with the sole exception represented by the secondary-educated, overeducated service class descendants). Importantly, for graduates in both countries, the absence of significant influence of social origin over career development contradicts Hypothesis 3b, which predicted persistent class advantages regardless of educational level (Breen et al., 2010). Of course, this does not entirely rule out that social origin does influence career achievement, as presented findings consider the role of social origin over the (early) career and are obtained after having removed the influence of social origin on the sorting of the first occupation.

5. Discussion and conclusions

The present study investigated the phenomenon of education-job (mis)match, with a particular focus on overeducation at labour market entry and its subsequent impact on workers' early career trajectories. Our central aim was to examine the role of social origin in shaping occupational trajectories after experiencing a 'bad entry', such as overeducation, in two distinct institutional contexts: Germany and the United Kingdom. By examining the career paths of overeducated and adequately matched labour market entrants, we explored whether an advantageous social background can help mitigate the initial socio-economic penalties of overeducation, and whether this advantage translates into enhanced career mobility over time.

When considering the association between 'bad entry' into the labour market and subsequent occupational achievements and trajectories, our analysis indicates that career mobility patterns are differentiated by social origin, but with substantial variation across institutional contexts and educational levels. Findings reveal that background-related compensatory advantages are more pronounced among workers without a tertiary degree in the more rigid and educationally stratified German labour market. Among those with a lower social background, the penalty persists, and workers experience more persistent disadvantages, limiting their chances of upward career mobility. On the other hand, in a liberal institutional context such as the United Kingdom, the accumulation of experience—despite the initially higher penalty—together with a labour market structure that favours greater mobility, is associated with a comparatively faster narrowing of the socio-economic gap between overeducated workers and matched workers having a secondary education. This suggests that structural mobility and enhanced opportunities for career progression can mitigate the early career disadvantage coming from overeducation.

These results remained largely unaltered when further restricting the population of interest, as exemplified in Appendix Figures B4-B6 and B7-B9, by excluding self-employed workers and part-time workers.

Notably, across both institutional settings, the magnitude of the initial socio-economic disadvantage varies by educational attainment. Tertiary degree holders have more to lose from a mismatch at labour market entry, and even those having ascribed advantages cannot manage to recover from the disadvantage associated with overeducation. Considering the different institutional settings, a further reflection can be made on the career achievements of overeducated labour market entrants across different educational levels. Empirical evidence on career (im)mobility in Germany confirms an educational-based segmentation, along the occupational socio-economic scale. Overeducated workers holding a tertiary degree have a higher socio-economic status than those without higher education, a pattern consistent with a system that reinforces the value of and differences between educational qualifications from the outset of the career (Barone & Schizzerotto, 2011; Marsden, 1990). The scenario differs in the United Kingdom, where overeducated degree holders experience a substantially larger penalty, and their socio-economic status appears only slightly higher than that of workers without a tertiary education.

The study, however, has limitations that warrant consideration. The method used to measure overeducation—Realised Matches (RM)—while offering advantages over self-assessment methods, assumes a homogeneous distribution of educational requirements within each occupational category (Berlingieri & Erdsiek, 2012). This assumption may lead to biases, potentially over- or under-estimating the extent of overeducation, especially in occupations already characterised by high levels of educational heterogeneity and mismatch (Leuven & Oosterbeek, 2011). Furthermore, the study does not address the horizontal dimension of education-job mismatch—specifically, the field of study—which has been shown to interact with social background in shaping the likelihood of facing overeducation (Capsada-Munsech, 2024).

Future research could build on the proposed design and measurement of overeducation by allowing the education-job matching conditions to vary over the life course (rather than focusing only on labour market entrance) to study the risk of entrapment into overeducation along the occupational career, which was not the purpose of this paper. The same applies to more thorough studies of the scarring effect of initial overeducation on wages and other monetary or non-monetary aspects. Furthermore, future research should shed light on the role of on-the-job training, which could help workers move out of a mismatched condition and improve occupational achievements in their early careers. Additionally, a more in-depth exploration of macro-institutional factors is still needed, and specifically in two directions: first, by operationalizing the role of specific institutions over time and across regions (e.g., employment protection legislation, labour market flexibilisation, active and passive labour market policies, training policies, and skill regimes), and second, by investigating the structural effect of school-to-work linkages on education-job mismatch. This could be achieved by integrating both vertical and horizontal dimensions of mismatch (DiPrete et al., 2017; Elbers et al., 2020), thus extending the framework proposed by Bol and colleagues (2019).

CRediT authorship contribution statement

Irene Michelin: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Filippo Gioachin:** Writing – review & editing, Supervision, Methodology, Data curation, Conceptualization. **Paolo Barbieri:** Writing – review & editing, Supervision, Project administration, Conceptualization.

Declaration of Competing Interest

None.

Appendix A: Descriptive tables

Tab.A1
Sample selection steps for Germany's sample

Germany	N Individuals	Person-year observations	% Individuals
Starting sample*	19.425	92.278	100%
Sample including only workers entered in LM between 1999 and 2019 (both included)	9.092	36.892	46,80%
Sample after the exclusion of data for years after the 10th career year	9.092	32.849	46,80%
Sample after the exclusion of labour market entrants having an educational level lower than upper secondary	6.109	23.829	31,45%
Sample after the exclusion of undereducated entrants	5.449	21.276	28,05%
Analytical sample	4.918	19.727	25,32%

* The starting sample included all individuals observed between 1999 and 2019 (both included), aged 35 years or less at the time of observation, employed or self-employed for at least one person-year observation, and with no missing information on ISCO and ISEI values. Individuals who did not report information on their first job are nevertheless included in the sample starting from the first available observation that meets these criteria.

Tab.A2
Sample selection steps for the United Kingdom's sample

United Kingdom			
	N Individuals	Person-year observations	% Individuals
Starting sample*	24.608	111.203	100%
Sample including only workers entered in LM between 1999 and 2019 (both included)	7.710	30.846	31,33%
Sample after the exclusion of data for years after the 10th career year	7.710	27.507	31,33%
Sample after the exclusion of labour market entrants having an educational level lower than upper secondary	7.204	26.064	29,27%
Sample after the exclusion of undereducated entrants	5.873	21.572	23,87%
Analytical sample	5.370	20.136	21,82%

* The starting sample included all individuals observed between 1999 and 2019 (both included), aged 35 years or less at the time of observation, employed or self-employed for at least one person-year observation, and with no missing information on ISCO and ISEI values. Individuals who did not report information on their first job are nevertheless included in the sample starting from the first available observation that meets these criteria.

Tab.A3
Covariates distribution among matched and overeducated LM entrants included in the analytical sample for Germany

Germany						
	Matched entrants		Overeducated entrants		Total	
	Proportion	SD	Proportion	SD	Mean	SD
Service class	.43	.49	.60	.49	.49	.50
Female	.56	.49	.49	.50	.53	.50
Migration background	.22	.41	.16	.37	.20	.40
East Germany	.27	.44	.27	.45	.27	.44
Vocational education	.66	.47	.30	.46	.53	.50
Educational level at LM entry						
Upper secondary	.89	.31	.19	.39	.66	.48
Lower tertiary	.07	.25	.23	.42	.12	.33
Upper tertiary	.04	.21	.58	.49	.22	.42
LM Entry cohort						
1999–2003	.29	.46	.29	.45	.29	.46
2004–2008	.22	.41	.32	.47	.25	.43
2009–2013	.23	.42	.28	.45	.25	.43
2014–2019	.26	.44	.11	.31	.21	.41
ISCO at LM entry (1digit)						
ISCO 1–2	.15	.35	.48	.50	.26	.44
ISCO 3–4	.48	.50	.26	.44	.40	.50
ISCO 5–6	.18	.39	.05	.21	.14	.34
ISCO 7–9	.19	.39	.21	.41	.20	.40

Tab.A4
Covariates distribution among matched and overeducated LM entrants included in the analytical sample for the United Kingdom

United Kingdom						
	Matched entrants		Overeducated entrants		Total	
	Proportion	SD	Proportion	SD	Mean	SD
Service class	.47	.50	.56	.50	.51	.50
Female	.59	.49	.54	.50	.57	.49
Migration background	.60	.49	.73	.45	.65	.48
Region at LM entry						
England	.73	.45	.74	.44	.73	.44
Wales	.10	.31	.08	.27	.10	.29
Scotland	.12	.32	.13	.34	.12	.33
Northern Ireland	.05	.22	.05	.22	.05	.22
Vocational education	.06	.24	.08	.28	.07	.26
Educational level at LM entry						
Upper secondary	.74	.44	.15	.35	.51	.50
Lower tertiary	.25	.43	.57	.49	.37	.49
Upper tertiary	.01	.08	.28	.45	.11	.31
LM Entry cohort						
1999–2003	.19	.40	.26	.44	.22	.41
2004–2008	.18	.39	.11	.32	.16	.36

(*continued on next page*)

Tab.A4 (*continued*)

United Kingdom						
	Matched entrants		Overeducated entrants		Total	
	Proportion	SD	Proportion	SD	Mean	SD
2009–2013	.40	.49	.42	.49	.40	.49
2014–2019	.23	.42	.21	.41	.22	.41
ISCO at LM entry (1digit)						
ISCO 1–2	.17	.37	.14	.35	.16	.36
ISCO 3–4	.24	.43	.30	.46	.26	.44
ISCO 5–6	.42	.49	.36	.48	.40	.49
ISCO 7–9	.17	.38	.20	.40	.18	.39

Appendix B: Marginal effects and robustness checks

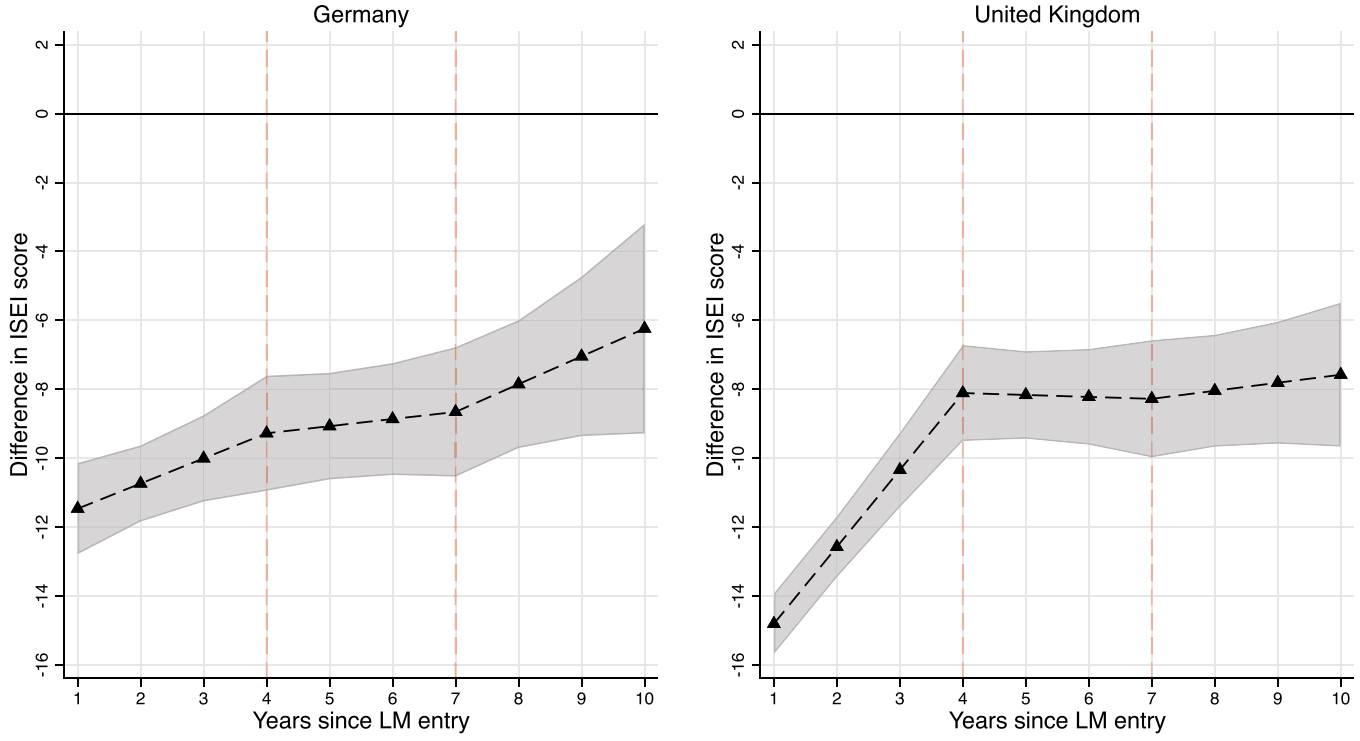

Fig. B1. Marginal effect of initial education-job matching on predicted ISEI over career development, in Germany and the United Kingdom. 1–10 years in the labour market are considered

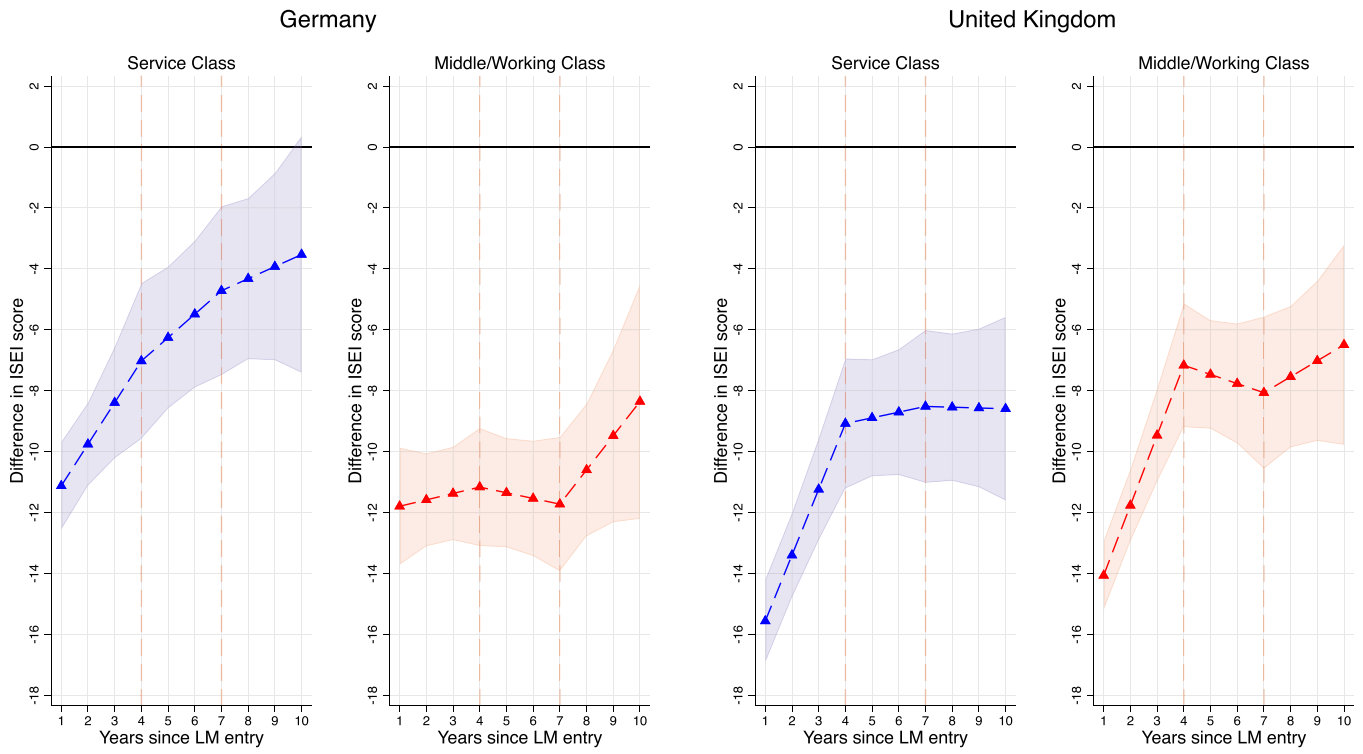

Fig. B2. Marginal effect of initial education-job matching on predicted ISEI over career development, distinguished by workers' social background, in Germany and the United Kingdom. 1–10 years in the labour market are considered

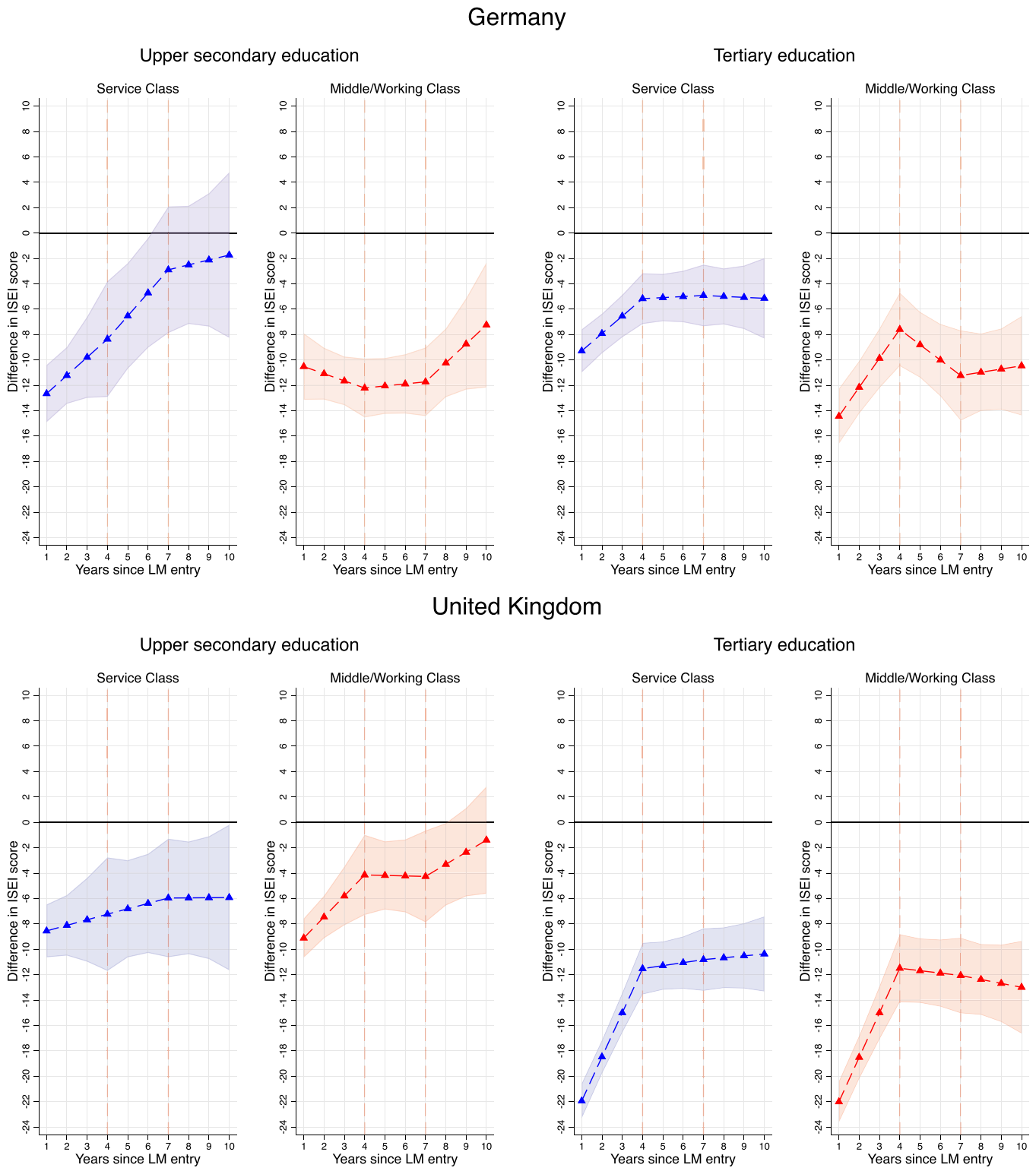

Fig. B3. Marginal effect of initial education-job matching on predicted ISEI over career development, distinguished by workers' social background and educational level, in Germany and the United Kingdom. 1–10 years in the labour market are considered

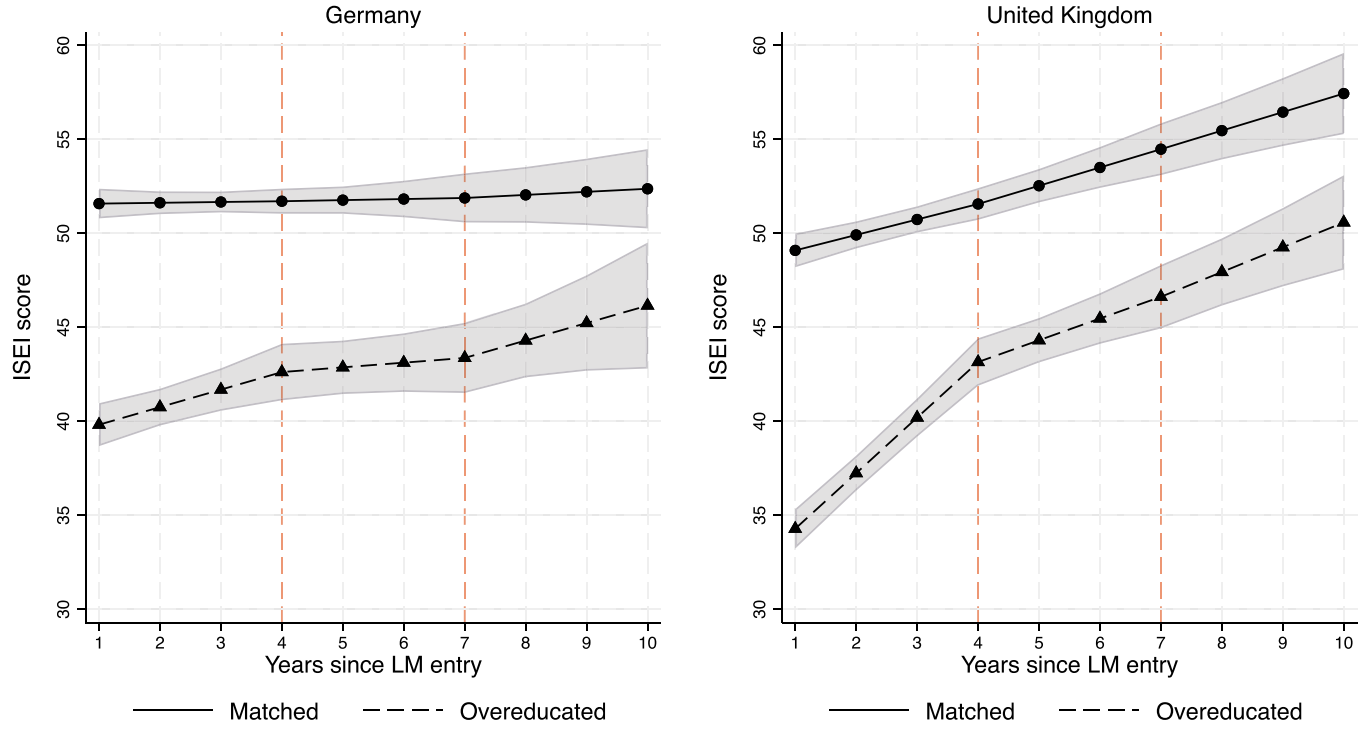

Fig. B4. Predicted ISEI over career development of matched and overeducated LM entrants, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Self-employed workers are excluded from the sample

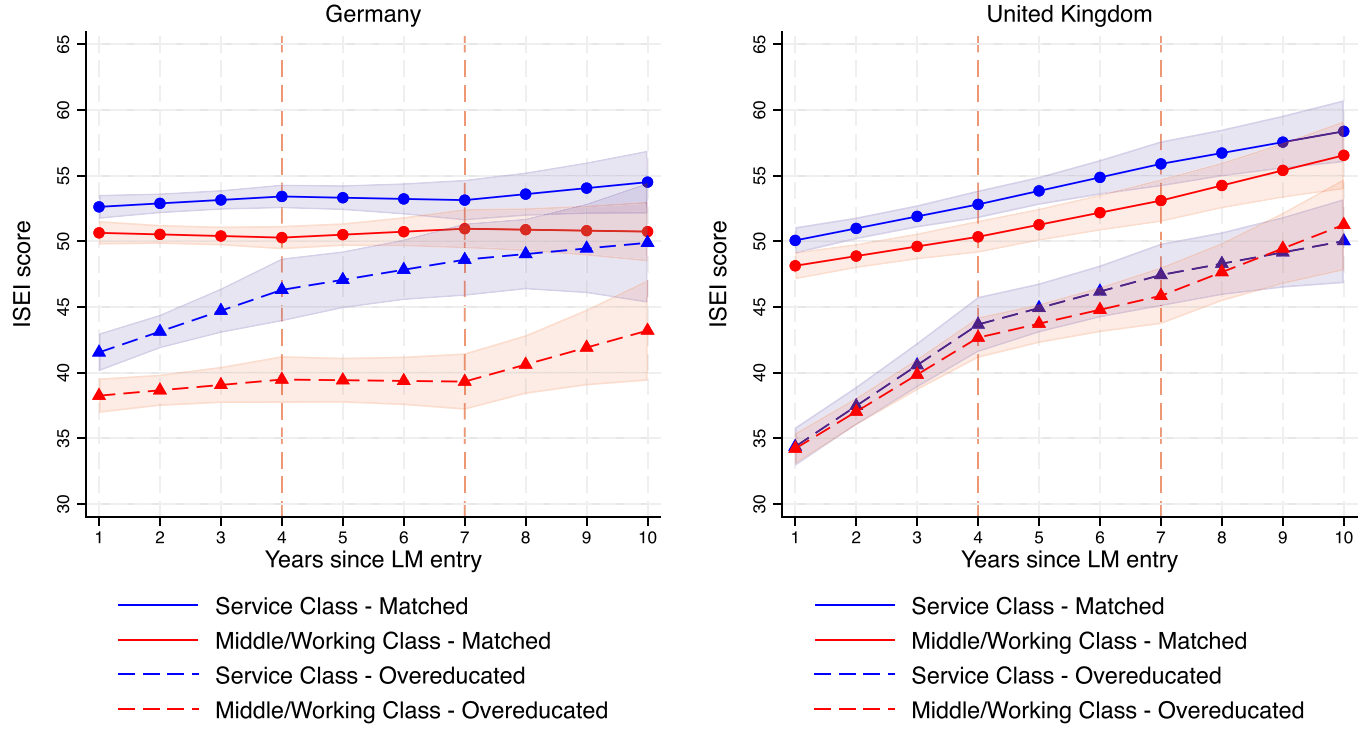

Fig. B5. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Self-employed workers are excluded from the sample

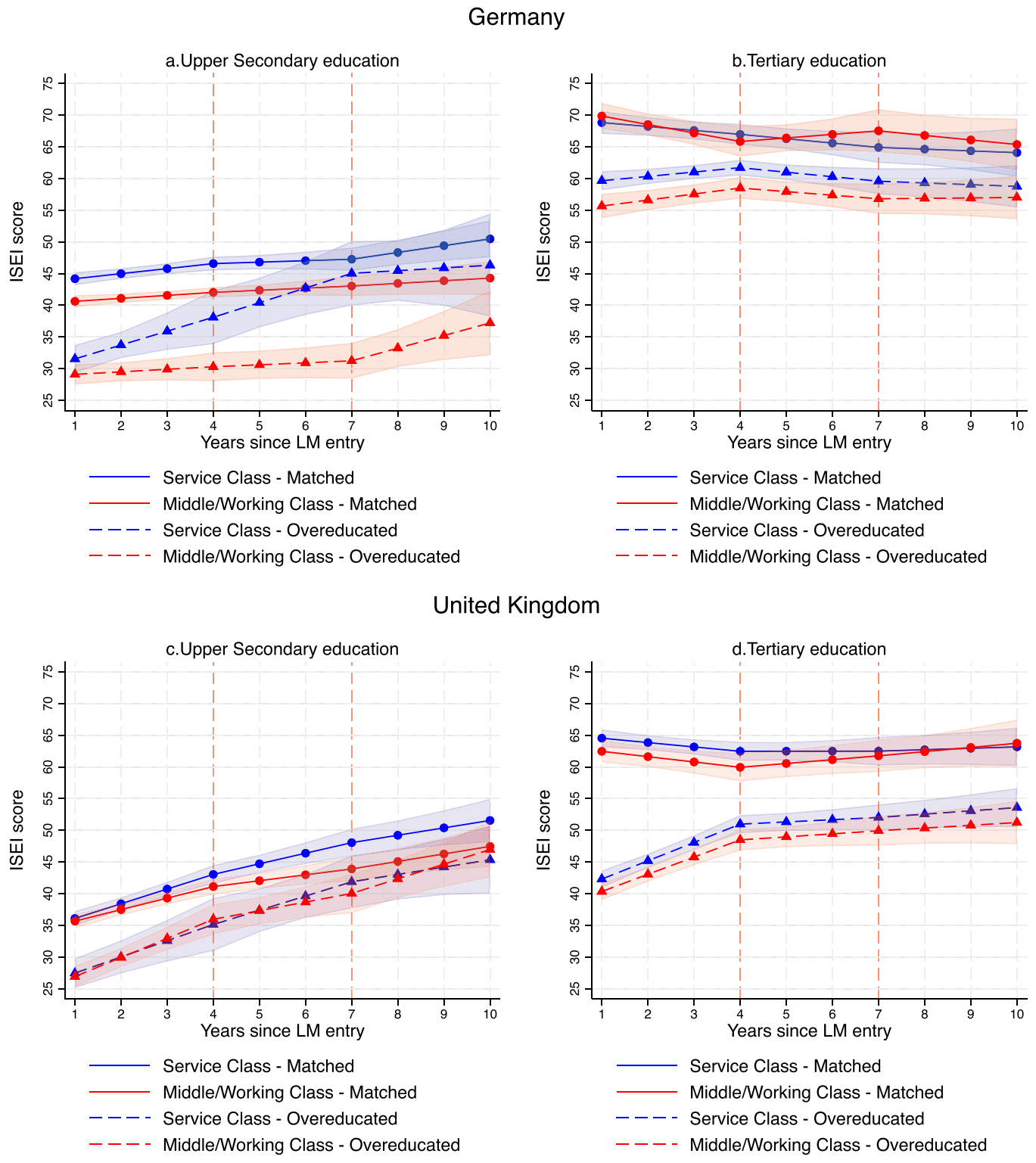

Fig. B6. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin and educational level, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Self-employed workers are excluded from the sample

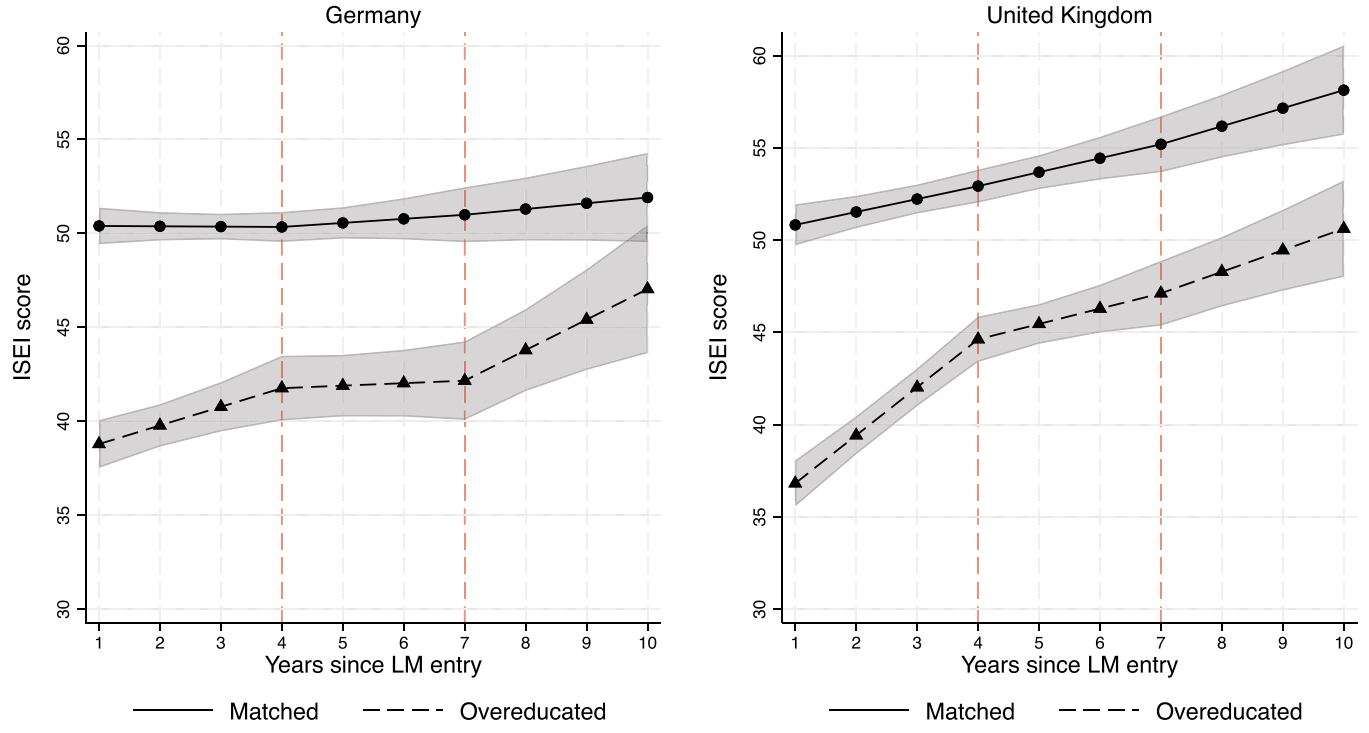

Fig. B7. Predicted ISEI over career development of matched and overeducated LM entrants, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Part-time workers are excluded from the sample

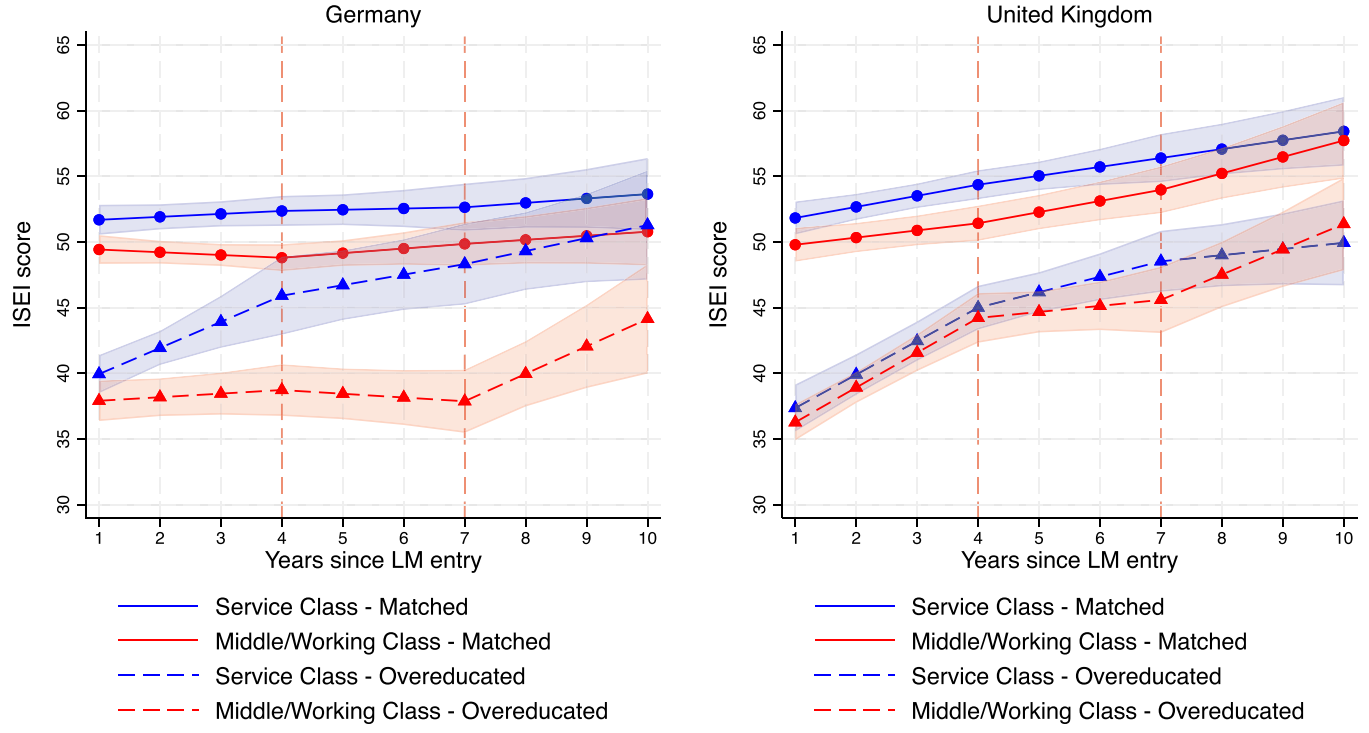

Fig. B8. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Part-time workers are excluded from the sample

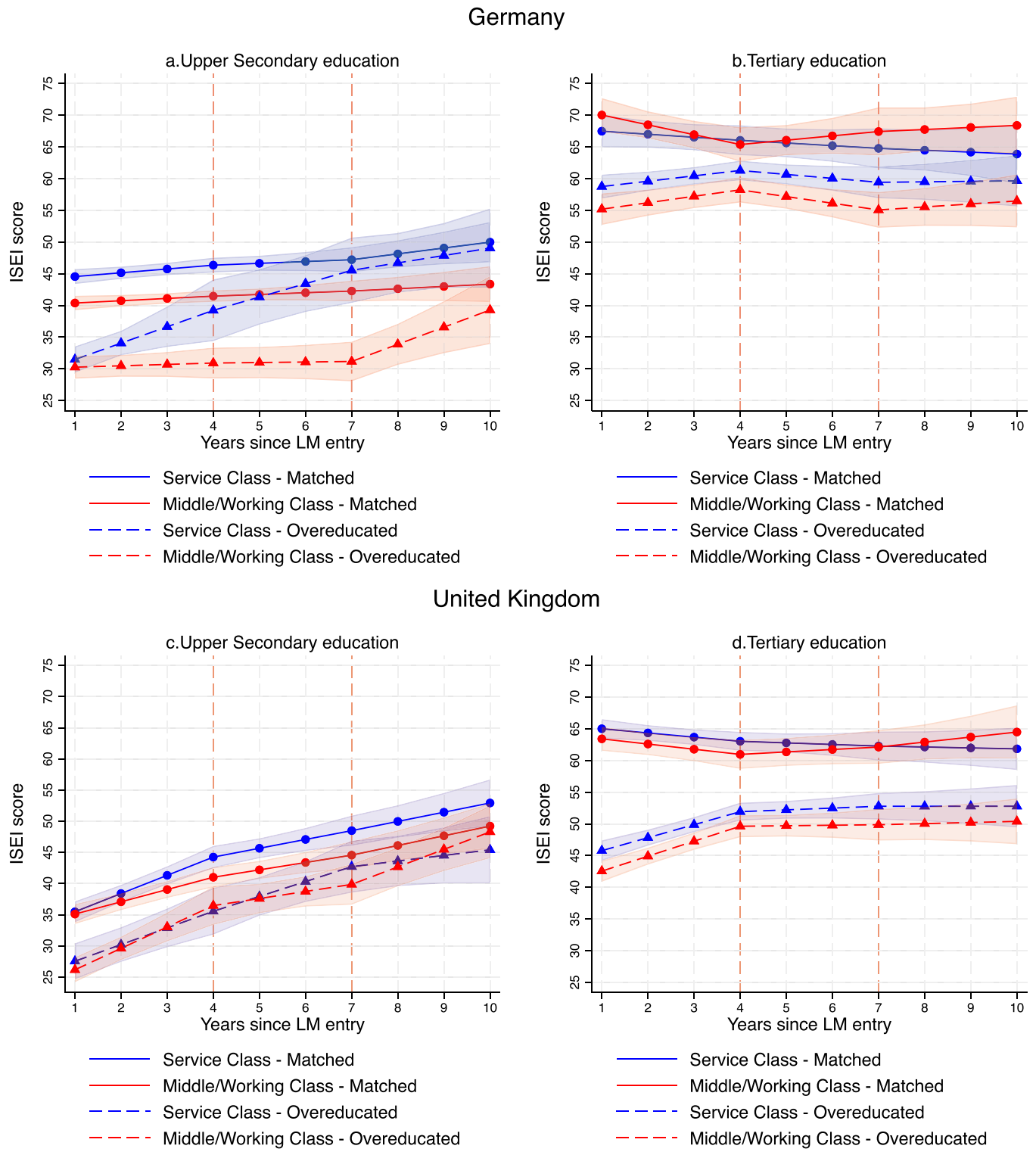

Fig. B9. Predicted ISEI over career development of matched and overeducated LM entrants according to their social origin and educational level, in Germany and the United Kingdom. 1–10 years in the labour market are considered. Part-time workers are excluded from the sample

Appendix C: Tables of marginal predictions

Table C1
Marginal predictions of ISEI by career stage and initial matching condition - in Germany. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

Germany				
	Matched		Overeducated	
Career	Margin	95% CI	Margin	95% CI
1	51.61	50.54–52.67	40.14	38.98–41.30
2	51.77	50.99–52.54	41.03	40.06–42.01
3	51.93	51.33–52.53	41.92	40.84–43.01
4	52.10	51.43–52.75	42.81	41.39–44.23
5	52.25	51.51–52.99	43.18	41.85–44.51
6	52.41	51.38–53.43	43.55	42.04–45.05
7	52.57	51.18–53.96	43.92	42.04–45.79
8	52.95	51.34–54.57	45.10	43.07–47.14
9	53.34	51.41–55.27	46.30	43.74–48.85
10	53.73	51.43–56.02	47.49	44.23–50.75

Table C2
Marginal predictions of ISEI by career stage and initial matching condition - in the United Kingdom. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

United Kingdom				
	Matched		Overeducated	
Career	Margin	95% CI	Margin	95% CI
1	49.09	48.20–49.98	34.28	33.25–35.32
2	49.90	49.18–50.62	37.33	36.40–38.25
3	50.71	50.01–51.41	40.37	39.34–41.39
4	51.52	50.68–52.36	43.41	42.12–44.70
5	52.37	51.50–53.25	44.21	43.07–45.35
6	53.23	52.15–54.30	45.01	43.70–46.31
7	54.08	52.72–55.44	45.81	44.12–47.49
8	55.08	53.56–56.59	47.03	45.25–48.82
9	56.07	54.30–57.84	48.26	46.21–50.32
10	57.07	54.96–59.17	49.49	47.05–51.93

Table C3
Marginal predictions of ISEI by career stage, social origin, and initial matching condition - in Germany. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

Germany					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	52.58	51.41–53.76	41.46	39.90–43.02
	2	52.95	52.05–53.85	43.20	41.86–44.54
	3	53.32	52.54–54.11	44.93	43.26–46.61
	4	53.70	52.80–54.59	46.67	44.34–49.00
	5	53.69	52.75–54.64	47.44	45.33–49.55
	6	53.69	52.48–54.91	48.21	46.00–50.42
	7	53.69	52.10–55.29	48.98	46.38–51.58
	8	54.24	52.50–55.98	49.92	47.30–52.54
	9	54.79	52.72–56.86	50.86	47.76–53.96
	10	55.34	52.81–57.86	51.81	47.94–55.68
Middle-working class	1	50.70	49.57–51.83	38.91	37.36–40.46
	2	50.69	49.83–51.55	39.11	37.84–40.38
	3	50.69	49.92–51.45	39.32	37.99–40.64
	4	50.68	49.79–51.58	39.52	37.84–41.20
	5	51.01	50.11–51.90	39.66	38.06–41.26
	6	51.33	50.17–52.50	39.80	38.00–41.59
	7	51.66	50.08–53.23	39.94	37.75–42.13
	8	51.94	50.21–53.67	41.34	39.01–43.68
	9	52.23	50.18–54.27	42.75	39.75–45.75
	10	52.51	50.04–54.98	44.16	40.23–48.08

Table C4
Marginal predictions of ISEI by career stage, social origin, and initial matching condition - in the United Kingdom. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

United Kingdom					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	50.04	49.04–51.04	34.48	33.02–35.94
	2	50.98	50.15–51.81	37.58	36.12–39.04
	3	51.92	51.07–52.77	40.68	38.98–42.38
	4	52.85	51.80–53.90	43.78	41.67–45.89
	5	53.68	52.62–54.74	44.79	42.90–46.67
	6	54.50	53.19–55.81	45.80	43.83–47.77
	7	55.33	53.63–57.03	46.81	44.47–49.15
	8	56.16	54.39–57.93	47.62	45.27–49.97
	9	57.00	55.00–58.99	48.43	45.80–51.06
	10	57.83	55.50–60.15	49.24	46.14–52.34
Middle-working class	1	48.14	47.11–49.18	34.08	32.94–35.22
	2	48.83	47.90–49.76	37.07	36.05–38.09
	3	49.52	48.52–50.52	40.05	38.81–41.30
	4	50.20	48.99–51.42	43.04	41.36–44.72
	5	51.09	49.88–52.30	43.62	42.21–45.03
	6	51.97	50.62–53.32	44.21	42.53–45.88
	7	52.85	51.25–54.46	44.79	42.49–47.09
	8	53.99	52.28–55.70	46.45	44.14–48.76
	9	55.13	53.08–57.17	48.11	45.41–50.81
	10	56.26	53.75–58.78	49.77	46.43–53.11

Table C5
Marginal predictions of ISEI by career stage, social origin, and initial matching condition - for upper secondary-educated labour market entrants in Germany. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

Germany (panel a)					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	43.72	42.21–45.23	31.06	28.64–33.49
	2	44.71	43.61–45.82	33.49	31.30–35.68
	3	45.71	44.81–46.61	35.91	32.96–38.87
	4	46.70	45.68–47.72	38.34	34.12–42.55
	5	47.05	45.95–48.16	40.51	36.67–44.36
	6	47.41	45.95–48.86	42.69	38.63–46.75
	7	47.76	45.83–49.69	44.87	40.09–49.65
	8	48.93	46.75–51.10	46.42	41.84–51.00
	9	50.09	47.48–52.70	47.96	42.75–53.18
	10	51.25	48.09–54.41	49.51	43.06–55.96
Middle-working class	1	40.19	38.81–41.56	29.67	27.64–31.69
	2	40.87	39.88–41.86	29.79	28.15–31.42
	3	41.55	40.80–42.30	29.90	28.24–31.56
	4	42.23	41.45–43.02	30.02	27.95–32.09
	5	42.62	41.72–43.51	30.57	28.52–32.61
	6	43.00	41.76–44.25	31.12	28.76–33.47
	7	43.39	41.69–45.09	31.66	28.77–34.56
	8	44.08	42.08–46.09	33.85	30.70–37.00
	9	44.78	42.33–47.23	36.04	31.99–40.09
	10	45.47	42.49–48.45	38.22	32.95–43.50

Table C6
Marginal predictions of ISEI by career stage, social origin, and initial matching condition - for tertiary-educated labour market entrants in Germany. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

Germany (panel b)					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	69.05	67.31–70.79	59.75	58.31–61.20
	2	68.37	66.92–69.82	60.45	59.30–61.61
	3	67.70	66.29–69.12	61.15	60.11–62.20

(*continued on next page*)

Table C6 (*continued*)

Germany (panel b)					
		Matched		Overeducated	
	4	67.03	65.39–68.67	61.86	60.68–63.03
	5	66.38	64.78–67.99	61.29	60.12–62.47
	6	65.73	63.86–67.61	60.73	59.25–62.21
	7	65.09	62.73–67.44	60.17	58.21–62.13
	8	64.91	62.47–67.34	59.91	57.74–62.08
	9	64.72	61.83–67.62	59.65	57.07–62.23
	10	64.54	60.95–68.14	59.40	56.29–62.51
Middle-working class	1	70.35	68.38–72.32	55.91	54.04–57.78
	2	68.97	67.27–70.67	56.82	55.25–58.38
	3	67.59	65.70–69.48	57.72	56.25–59.18
	4	66.21	63.79–68.63	58.62	57.00–60.24
	5	66.86	64.73–69.00	58.06	56.50–59.62
	6	67.51	65.06–69.96	57.50	55.68–59.32
	7	68.16	64.98–71.35	56.94	54.65–59.22
	8	67.98	65.05–70.91	57.01	54.61–59.41
	9	67.80	64.59–71.02	57.08	54.32–59.85
	10	67.62	63.70–71.54	57.16	53.86–60.45

Table C7
Marginal predictions of ISEI by career stage, social origin, and initial matching condition - for upper secondary-educated labour market entrants in the United Kingdom. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

United Kingdom (panel c)					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	35.92	34.74–37.11	27.37	24.91–29.83
	2	38.25	37.20–39.30	30.13	27.38–32.89
	3	40.58	39.38–41.77	32.90	29.41–36.39
	4	42.90	41.36–44.44	35.67	31.20–40.13
	5	44.42	42.97–45.86	37.61	33.90–41.32
	6	45.93	44.26–47.60	39.55	35.94–43.16
	7	47.45	45.33–49.56	41.49	37.28–45.70
	8	48.64	46.39–50.89	42.69	38.71–46.68
	9	49.84	47.18–52.49	43.90	39.55–48.25
	10	51.03	47.79–54.27	45.11	39.94–50.28
Middle-working class	1	35.51	34.40–36.62	26.39	24.80–27.99
	2	37.28	36.32–38.24	29.82	28.29–31.36
	3	39.05	37.99–40.11	33.25	31.24–35.27
	4	40.82	39.47–42.17	36.68	33.91–39.45
	5	41.75	40.48–43.02	37.57	35.39–39.74
	6	42.67	41.20–44.15	38.45	36.15–40.76
	7	43.60	41.73–45.47	39.34	36.28–42.40
	8	44.85	42.81–46.88	41.54	38.57–44.51
	9	46.09	43.60–48.57	43.74	40.37–47.10
	10	47.33	44.23–50.44	45.94	41.82–50.05

Table C8
Marginal predictions of ISEI by career stage - social origin and initial matching condition - for tertiary-educated labour market entrants in the United Kingdom. The model controls for all the covariates included in the equation reported in Section 3.2.2 of the paper, held at their means. All the predicted ISEI scores are statistically significant

United Kingdom (panel d)					
		Matched		Overeducated	
Social Origin	Career	Margin	95% CI	Margin	95% CI
Service class	1	64.53	63.13–65.92	42.57	41.22–43.92
	2	63.87	62.71–65.02	45.39	44.29–46.48
	3	63.21	62.02–64.39	48.20	47.09–49.32
	4	62.55	61.08–64.02	51.02	49.62–52.42
	5	62.40	60.95–63.85	51.11	49.74–52.48
	6	62.26	60.53–63.98	51.20	49.59–52.82
	7	62.11	59.91–64.31	51.30	49.27–53.32
	8	62.29	59.97–64.61	51.63	49.38–53.87
	9	62.47	59.86–65.09	51.96	49.35–54.57
	10	62.66	59.63–65.68	52.29	49.22–55.35

(*continued on next page*)

Table C8 (*continued*).
United Kingdom (panel d)

		Matched		Overeducated	
Middle-working class	1	62.54	60.81–64.28	40.53	39.17–41.88
	2	61.70	60.05–63.34	43.19	42.04–44.33
	3	60.84	59.01–62.68	45.85	44.59–47.10
	4	60.00	57.76–62.24	48.51	46.89–50.12
	5	60.53	58.36–62.70	48.85	47.25–50.44
	6	61.06	58.78–63.34	49.18	47.34–51.03
	7	61.59	59.04–64.14	49.52	47.24–51.81
	8	62.23	59.62–64.84	49.85	47.46–52.24
	9	62.87	58.84–65.89	50.18	47.43–52.93
	10	63.51	59.83–67.19	50.51	47.23–53.79

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